REMARKS/ARGUMENTS

General comments:

The use of opposing layers of hard magnetized material that flank the free layer, serving to give it longitudinal stability, has been standard practice in the art for some time. Both the cited prior art and the present invention teach ways to further improve stability of this type. However, they take quite different approaches to achieving this.

The present invention teaches a method for improving the stability of the free layer through the introduction of a second pair of stabilizing layers, located either above or below the standard stabilizing layer and magnetizing it in a direction that is antiparallel to that of the first bias layer, thereby magnetostatically canceling out most of the external field of the first bias layer.

The cited prior art does not introduce a second pair of stabilizing layers similar to the first pair of stabilizing layers. Instead, it stabilizes the free layer directly by magnetically pinning it at its edges in the same way that the pinned layer in a spin valve is formed.

Reconsideration is requested of all rejections based on 35 U.S.C. 102:

With regard to claims 1 and 17, Examiner states that Gill teaches "...a pair of additional bias layers 142...". This is incorrect. As can be seen in Gill's FIG. 4, layer 142 is a ferromagnetic layer that, together with layer 134, forms a synthetic antiferro-magnetic structure that is exchange coupled through seed layer 130 to free layer 68,

the full structure being designated as 120 in Gill's FIG. 4. Because layer 142 is part of a synthetic antiferromagnetic structure, each instance of layer 142 operates independently of the other, there being little or no magnetic field between the two instances of layer 142 that are shown in FIG. 5. This makes it impossible for layers 142 to serve as additional bias layers.

With regard to claims 5 and 24, since layers 142 are not an additional pair of bias layers, their distance from the permanent magnet layer is irrelevant.

Reconsideration is requested of all rejections based on 35 U.S.C. 103:

With regard to claims 9 and 25, we agree that Gill could have located his free layer at the bottom of the GMR stack in which case his layer 142 would have had to be below the permanent magnet layers. Such a change in geometry does not, however, alter the fact that layer 142 does not, and cannot, act as an additional bias layer, as has already been discussed above.

With regard to claims 2, 13, 21, and 29, these claims teach materials that are suitable for use in secondary bias magnets. The first three listed, CoPt, CoCrPt, and CoNiCr, are magnetically hard materials suitable for use in hard bias magnets while the remaining two, NiFe/IrMn and CoFe/IrMn are laminates of a soft magnetic material on an antiferromagnetic underlay. The latter two materials will sustain an external bias field between two instances of themselves. This is NOT true of the synthetic antiferro-magnetic structures used by Gill to stabilize his free layer.

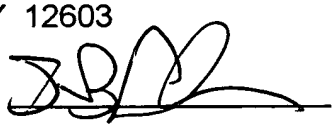
Claims 3-8 are all dependent on claim 1 and stand or fall with it. Claims 10-12

and 14-16 are all dependent on claim 9 and stand or fall with it. Claims 18-20 and 22-24 are all dependent on claim 17 and stand or fall with it. Claims 26-28 and 30-32 are all dependent on claim 25 and stand or fall with it.

Applicant respectfully requests that a timely Notice of Allowance be issued in this case.

Respectfully submitted,

GEO. O. SAILE & ASSOCIATES
28 Davis Avenue
Poughkeepsie
NY 12603

By 

Stephen B. Ackerman
Reg. No. 37761